



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 5  
77 WEST JACKSON BOULEVARD  
CHICAGO, IL 60604-3590

REPLY TO THE ATTENTION OF:

SR- 6J

February 5, 2013

Mr. Michael J. Erickson  
Vice President  
ARCADIS  
10559 Citation Drive, Suite 100  
Brighton, Michigan 48116

RE: Area 1: Draft Feasibility Study Report

Dear Mr. Erickson:

The U.S. Environmental Protection Agency (EPA) has completed its review of the Area 1 draft Feasibility Study (FS) report, submitted on October 30, 2012, for the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site. The FS report presents the evaluation of remedial alternatives for Area 1 of the Kalamazoo River from Morrow dam to the former Plainwell dam, and including portions of Portage Creek from Alcott Street to the confluence of the Kalamazoo River.

EPA has significant comments on the FS report which requires revision of the document and the evaluation of additional remedial alternatives. Enclosed are EPA's comments on the FS report. Therefore, EPA disapproves the Area 1 FS report pending receipt of adequate responses to the enclosed comments and a revised report. Pursuant to the 2007 Agreement on Consent the revised FS report is due (45) forty-five days after receipt of this letter.

Please contact me at (312) 886-0992 if you have any questions regarding this matter.

Sincerely,

A handwritten signature in black ink, appearing to read "James A. Saric", is written over a horizontal line.

James A. Saric  
Remedial Project Manager  
SFD Remedial Response Branch #1

Enclosure

cc: Paul Bucholtz, MDNRE  
Garry Griffith, Georgia-Pacific  
Richard Gay, Weyerhaeuser  
Jamie McCarthy, KRWC

**U.S.EPA COMMENTS  
ON THE  
AREA 1 FEASIBILITY STUDY  
ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER SITE**

**GENERAL COMMENTS**

**Commenting Organization: EPA  
General Comment #: 1**

**Commenter: Saric/Keiser**

Key information that is currently provided in Appendix A (the revised alternative screening technical memorandum (ASTM)) should be moved into the main body of the report, including full descriptions of the time-critical removal actions (TCRAs), summaries of the remedial investigation (RI) results and conceptual site model (CSM), and the development of the preliminary remediation goals (PRGs). Several of these items are discussed further in other general comments below.

**Commenting Organization: EPA  
General Comment #: 2**

**Commenter: White/ORC**

The main body of the feasibility study (FS) report would benefit from more "stage setting" before describing and evaluating the remedial alternatives for Area 1 sediments and floodplain soils. Please add a subsection to Section 1 that summarizes the CSM for Area 1. Most of the information related to the CSM is in Appendix A or in other sections of the FS report. The CSM should include the following:

- A physical description of the river system.
- A description of the nature and extent of contamination (summary of RI findings), including a table summarizing polychlorinated biphenyl (PCB) mass and average concentration estimates for hot spots, Crown Vantage, Portage Creek (post-TCRA), river sections 1 through 8 (excluding hot spots and Crown Vantage), river banks (main channel and post-TCRA Portage Creek), natural floodplains (main channel and post-TCRA Portage Creek), and floodplains within the former impoundments.
- A full description of PCB fate and transport processes, including assessments of channel stability and bank erosion, water column transport, sediment transport, sediment-water transfer processes, and bioaccumulation processes. Bank erosion, channel stability, and overall geomorphology of the river should be more fully described and considered because the processes control future loading of PCBs to the river, and therefore, future fish tissue concentrations.
- Pathways and receptors associated with unacceptable risks.
- Include maps that identify ownership of parcels on the floodplains, and overlay the ownership map with information that identifies the most recent PCB data for the parcels. On the map, also identify all parcels that have occupiable structures (for example, commercial, industrial, and residential), if any.

**Commenting Organization: EPA**  
**General Comment #: 3**

**Commenter: White**

Section 1 of the report should include a subsection that describes all of the TCRA's and summarizes all available information about their effectiveness (including an assessment of whether it is "too soon to tell"). It should include maps showing the extent of the removal actions in the three TCRA areas. The information is important to present at the beginning of the report because it provides insight into the potential effectiveness of the remedial action being considered in the FS.

**Commenting Organization: EPA**  
**General Comment #: 4**

**Commenter: ORC**

Because the bank soil in certain areas is a source of contamination to the river, the discussion of the remedial alternatives should clearly describe how the river banks are being addressed in either the sediment or floodplain remedial alternatives. This comment is relevant to both the text and applicable or relevant and appropriate requirements (ARAR) table. For the ARAR table, the area addressed should not be referred to in terms of sediment and soil; instead, it should be either "sediment, bank soil, and floodplain soil" or "in-stream sediment, bank sediment, and floodplain soil."

Throughout the FS, wherever future loading of PCBs to the river and the impact of loading to fish tissue is discussed, add "and water quality standards." Further, the FS should acknowledge that any PCB-containing floodplain soils and/or river bank soils left in place may be an ongoing source of PCBs to the river.

**Commenting Organization: EPA**  
**General Comment #: 5**

**Commenter: Saric**

The Executive Summary should be revised to incorporate the comments presented herein.

**Commenting Organization: EPA**  
**General Comment #: 6**

**Commenter: White**

The scale of the evaluation (area-wide decision unit) is too large for remedy decision-making. Pre- and post-remedy sediment surface-weighted average concentrations (SWACs) should be reported by river section, as established in the RI, rather than area-wide.

**Commenting Organization: EPA**  
**General Comment #: 7**

**Commenter: Saric/White**

Some of the assumptions and methods used to estimate future fish tissue concentrations should be revisited, including the following:

- The assumption that the future sediment recovery rate is the same as the historical rate of fish tissue decline in PCB concentration
- A step change (reduction) in fish tissue concentrations occurs when remedial action is completed

- The use of wet-weight fish tissue data rather than lipid-normalized data to establish historical trends

Additionally, the presentation of the results of the future fish tissue projections is difficult to interpret and compare across alternatives. Specific comments regarding these topics and others are provided in the comments to Appendix E.

**Commenting Organization: EPA**  
**General Comment #: 8**

**Commenter: Saric/White**

Remedial action objective (RAO) 1 should incorporate the following: (1) the expected increase in allowable fish meals, (2) the target risk and hazard levels for protection, and (3) the time-frame to achieve them, as follows:

Protect humans who consume Kalamazoo River fish from exposure to PCBs that exceed protective levels. The RAO is expected to be progressively achieved over time by meeting the following targets for sediment and fish tissue:

- Sediment Target—Achieve a PCB SWAC of 0.33 milligram per kilogram (mg/kg) in each of the eight segments within Area 1 of the Kalamazoo River within 10 years following remedy implementation
- Fish Tissue Targets—
  - o A reduction in the Michigan fish advisory level for smallmouth bass to one meal per week (0.05 to 0.2 mg/kg total PCB concentration in fish tissue)
  - o Achievement of a noncancer hazard index (HI) of 1.0 and a cancer risk of  $10^{-5}$  for the high-end sport angler (100 percent bass diet) within 10 years following remedy implementation

This comment applies to all sections of the FS report where RAOs are presented.

**Commenting Organization: EPA**  
**General Comment #: 9**

**Commenter: Saric/White**

More discussion is needed to justify the use of a sediment PRG that is above risk-based concentrations (RBCs) for the high-end sport angler (equivalent to the reasonable maximum exposure [RME] scenario typically used by EPA for remedial decision-making). If RBCs based on the RME are not achievable over a reasonable time frame, then discussion in the FS needs to be expanded to make the case. For example, if the RME values are not achievable, then a discussion of the appropriateness of the central tendency can further explain the role of the 0.33 part per million (ppm) PRG for sediment.

**Commenting Organization: EPA**  
**General Comment #: 10**

**Commenter: Saric/White**

Revise RAO 4 as follows:

Reduce the transport of PCBs from Area 1 to downstream areas and Lake Michigan, including transport of PCBs from the riverbank and floodplain soils to the Kalamazoo River.

This RAO is intended to reduce the rate of transport of PCBs from Area 1 to downstream areas of the Kalamazoo River and Lake Michigan. Ongoing monitoring of channel stability should be included in the monitored natural recovery (MNR) component of the remedial alternatives to monitor the transport pathways. If sediment and fish tissue PCB levels don't decrease as expected through natural recovery, then the ongoing loading from the banks and floodplain may need to be re-examined more closely. This comment applies to all sections of the FS report where RAOs are presented.

**Commenting Organization: EPA**  
**General Comment #: 11**

**Commenter: Saric**

Future bank and floodplain soil erosion in the former Plainwell Impoundment Plainwell No. 2 dam area is not adequately addressed in the FS. The FS references the 2007 AOC for the former Plainwell impoundment with respect to long-term monitoring and maintenance of the channel banks in these areas. However, the remedial alternatives for floodplain soils need to be evaluated in the FS with respect to RAO 4; that is, how does each alternative prevent the transport of PCBs in bank and floodplain soils to the channel?

**Commenting Organization: EPA**  
**General Comment #: 12**

**Commenter: Saric**

Sediment alternatives: Alternative SED-2 is essentially the same as SED-1, and neither alternative is protective. Why include alternative SED-2?

**Commenting Organization: EPA**  
**General Comment #: 13**

**Commenter: White**

The estimated sediment SWACs in the former Plainwell Impoundment and Plainwell No. 2 dam area are higher than the SWACs in the other river sections. The channel in the former Plainwell Impoundment is in the process of reaching a new equilibrium state after removal of the dam. Baseline monitoring prior to remedy implementation should include sediment sampling to verify that channel sediments in these areas are recovering as expected (that is, to verify whether any hot spots remain).

**Commenting Organization: EPA**  
**General Comment #: 14**

**Commenter: White**

The FS assumes that the long-term monitoring program will include only fish tissue monitoring. The sediment and floodplain remedial alternatives are based on assumptions that will need be verified after the remedy is implemented (for example, the sediment prism in the former Plainwell Impoundment will be eroded as the river channel reaches a new equilibrium state; the banks in the former Plainwell Impoundment and Plainwell No. 2 dam area will remain stable and will not provide an ongoing source of PCBs to the channel; floodplain soils in the former impoundments will not act as a significant source of PCBs to the river channel even under high flow conditions). Additionally, uncertainty remains regarding the risk to ecological receptors exposed to floodplain soils. Therefore, the scope of the long-term monitoring component of the remedy must be expanded to include verification of the critical assumptions used in the FS and the protectiveness of the remedy.

Commenting Organization: EPA  
General Comment #: 15

Commenter: Saric/Dillon

The recent publication by Manning, et al. 2013 indicates that the relative sensitivity of avian receptors to the effects of dioxins/furans and dioxin-like PCB congeners is more complex than the simple classification system of high, moderate, and low sensitivity. The results of the current research suggest that there is no simple ratio of species sensitivity between the groups based on AhR structure and that the relative sensitivity is also affected by the mix of congeners, which suggest that sensitivity is partially site-specific.

EPA acknowledges that there continues to be uncertainty around this issue as the science develops further. However, EPA believes that it is inappropriate and premature to conclude in the FS that current conditions are adequately protective of avian species and that, therefore, RAO 3 has been achieved. The uncertainty raised by Manning, et al. 2013 should be acknowledged, and any discussion of current conditions should reflect the potential risk to a sensitive avian species at the site.

EPA does not believe it is necessary to revise the language in the ASTM document, but text should be included in the FS that indicates that following drafting of the ASTM, further research has been published that indicates that the relative sensitivity of avian receptors is more complex than previously thought, and that the text of the terrestrial baseline ecological risk assessment (TBERA) and ASTM do not reflect that uncertainty. However, that uncertainty is considered in the FS when characterizing current conditions and the relative risk reduction of the various alternatives.

Manning G. E., L. J. Mundy, D. Crump, S. P. Jones, S. Chiu, J. Klein, A. Konstantinov, D. Potter, and S. W. Kennedy. 2013. "Cytochrome P4501A induction in avian hepatocyte cultures exposed to polychlorinated biphenyls: Comparisons with AHR1-mediated reporter gene activity and *in ovo* toxicity." *Toxicology and Applied Pharmacology* 266 (2013) 38-47.

Commenting Organization: EPA  
General Comment #: 16

Commenter: Saric/Dillon

Given the uncertainty raised by the Manning, et al. (2013) results, EPA believes that floodplain soils alternatives FP-1 and FP-2 would require some form of biological monitoring and re-evaluation as new research is completed to assure that residual risk to maximally exposed and sensitive wildlife is acceptable.

Commenting Organization: EPA  
General Comment #: 17

Commenter: Saric/Dillon

The supplemental RI and ASTM documents have analyzed and discussed the floodplains associated with the former Plainwell Impoundment, Plainwell No. 2 dam, and natural floodplain areas separately. The TBERA concluded that there was no unacceptable risk in the natural floodplain areas. The analysis in the ASTM and FS of areas requiring potential remediation is based on 1- and 2-acre wildlife home ranges. Given the distance between the

former Plainwell Impoundment and Plainwell No. 2 dam areas, it is inappropriate to only present FS evaluation based on a combination of the two areas. The FS must include a discussion of current conditions in each area and an evaluation of the potential risk reduction by area.

**Commenting Organization: EPA**  
**General Comment #: 18**

**Commenter: Saric/Dillon**

Section 5.2.1 of the ASTM, page 5-17, when discussing the RBCs for floodplain soils, states the following, "the true toxicity threshold likely lies somewhere between the no observed adverse effect level (NOAEL) and lowest observed adverse effect level (LOAEL) values. As such, the geometric mean of the NOAEL and LOAEL is considered a reasonably conservative estimate of the potential toxicity threshold." To be consistent with the ASTM therefore, the PRG for floodplain soils to be adopted in the FS should be 11 mg/kg PCBs. This RBC is assumed to be protective of maximally exposed wildlife.

Based on the analysis in the ASTM, this RBC is shown to be protective of 94 percent of the home ranges for maximally exposed mammalian receptors such as the shrew. The RBC of 11 mg/kg PCBs is also assumed to be protective of avian receptors as it represents a balance between risk and uncertainty surrounding the various methodologies and assumptions for calculating risk to avian receptors employed in the TBERA. A PRG of 11 mg/kg PCBs is protective of high-sensitivity vermivorous and insectivorous birds assuming dietary exposure models but is protective of minimal home ranges (1 percent) assuming egg-based exposure models.

**Commenting Organization: EPA**  
**General Comment #: 19**

**Commenter: Saric/Dillon**

The ASTM and FS use 80 percent of home ranges as an assumed threshold for protection of local populations. But no rationale is provided to support that value. To avoid lengthy discussions concerning an appropriate threshold, eliminate any discussion of a target percentage of home range assumed to be protective of populations. The evaluation should focus on the risk reduction from current conditions both in the number of home ranges and the overall acreage for the individual target areas. Protection of local populations can be discussed in this context.

**Commenting Organization: EPA**  
**General Comment #: 20**

**Commenter: Andrae/Keiser**

**Sediment Alternatives** – The term "conventional construction equipment" is used often to describe the mechanical excavation of the sediment; however, details on how the sediment is to be removed and staged in the alternatives description text are minimal. It would be helpful to provide more detail in the up-front text, versus the cost estimate notes on how the sediment would be excavated and managed. Some suggested details include the following:

- Excavators located on the shore or on floats
- Use of environmental buckets or clamshells versus conventional buckets or clamshells
- Size and loading of barges acceptable for use on the Kalamazoo River



- Location of staging areas (show on figures and provide schematic of staging area)
- Figure of typical hot spot excavation layout including silt fencing, access roads, and monitoring locations
- Sediment offloading structure and dewatering procedure

**Commenting Organization: EPA**  
**General Comment #: 21**

**Commenter: Andrae**

Floodplain Soils – Is armoring of the banks to prevent erosion included in the alternatives?

**Commenting Organization: EPA**  
**General Comment #: 22**

**Commenter: Saric**

Section 2 needs to provide more detailed information while summarizing how the PRGs, remedial action levels (RALs), and target areas and volumes were established, rather than simply referencing the ASTM Sections 4 and 5. Currently, Section 2 of the FS does not do an adequate job informing the reader of the rationale behind the selection of PRGs, RALs, or the establishment of the target areas and volumes as discussed in the ASTM.

**Commenting Organization: EPA**  
**General Comment #: 23**

**Commenter: Saric**

Although summarizing the ARARs is helpful, there should be one complete table of the ARARs in the FS document, and it should not be simply referenced as part of the ASTM.

**Commenting Organization: EPA**  
**General Comment #: 24**

**Commenter: Saric**

Section 4 needs to more clearly define the work that was completed in each of the TCRA in Area 1, including pre- and post-TCRA PCB concentrations, mass removal, volumes, cost, etc. These actions are part of the remedy being selected in Area 1, and the FS needs to document that the remedies were conducted and what was accomplished.

**Commenting Organization: EPA**  
**General Comment #: 25**

**Commenter: Saric**

Section 4 needs to more clearly describe each alternative in more detail and not simply reference the ASTM.

**Commenting Organization: EPA**  
**General Comment #: 26**

**Commenter: Saric**

It is inappropriate to assume 3 years to complete the Consent Decree and implement complete design for the various remedies discussed in the FS. The time period will most likely be significantly less. Further, the comparison of alternatives should only compare the time to implement each remedy once construction begins, assuming they all start approximately at the same time.

**Commenting Organization: EPA**  
**General Comment #: 27**

**Commenter: Saric**

Although remedy option SED-6 may take seven construction seasons to complete, the time-frame from Record of Decision (ROD) to complete the design should be no different than the other SED alternatives. All of the SED alternatives should be assumed to start at the same time; however, they would require longer time-frames to complete. All related discussions for the various alternatives and any related graphs indicating timeframes to meet various cleanup levels need to illustrate the remedies beginning at the same time.

**Commenting Organization: EPA**  
**General Comment #: 28**

**Commenter: Saric**

SED-3 through SED-5 remedies should compare SWACs and risk reduction of fish contaminant concentrations relative to the individual river sections in which the hot spots exist. The FS only compares residual risk and the individual remedies to the sitewide SWAC. The comparison should discuss existing SWACs in these areas, and relative changes to the SWACs in the areas.

**Commenting Organization: EPA**  
**General Comment #: 29**

**Commenter: Saric**

SED-3 through SED-5 remedies should further discuss how removal of the hot spots would meet RAO 4, since the hot spot areas could transport PCB materials downstream. Such evidence of transport exists in some previously sampled hot spot areas (such as KPT20 and KPT23) that showed decreases in PCB concentration between the 1993 sampling and most recent sampling events, which is most likely is a result of the river moving materials from one area and redepositing the material at other downstream locations.

**Commenting Organization: EPA**  
**General Comment #: 30**

**Commenter: Saric**

Chapter 6, Summary and Conclusions, should be completely rewritten based upon the general and specific comments provided.

**Commenting Organization: EPA**  
**General Comment #: 31**

**Commenter: ORC**

The ARAR section will need to incorporate changes made by EPA after the state submits its ARAR list to EPA and EPA reviews the list. The NCP and 40 *Code of Federal Regulations* §§ 300.400(g), 300.430 and 300.515 provide the support agency the opportunity to identify its respective potential ARARs. At the time of this review and comment, the state has not submitted its ARAR list to EPA. EPA has requested the list, and the state has agreed to furnish it.

**Commenting Organization: EPA**  
**General Comment #: 32**

**Commenter: ORC**

Add the following components to the floodplain alternatives:

- a) Environmental covenants and/or other equivalent institutional controls that would prohibit occupiable buildings (residential, commercial, and/or industrial) and other nonrecreational use to those floodplain alternatives that leave PCBs that exceed 2.5 ppm in place. Identify contingency plans for property owners who may be unwilling to execute such environmental covenants.
- b) Existing and proposed river bank armoring and other controls for river banks.

**Commenting Organization: EPA**  
**General Comment #: 33**

**Commenter: ORC**

Describe how the remedial alternatives will be "preventing, reducing, or controlling . . ." the hazardous substances, pollutants, or contaminants that are collocated with PCBs or otherwise found at the site.

The supplemental RI/FS AOC requires Georgia Pacific to conduct an FS "to identify and evaluate remedial alternatives that protect human health and the environment by preventing, eliminating, reducing, or controlling any release or threatened release of hazardous substances, pollutants, or contaminants at or from the site."

**Commenting Organization: EPA**  
**General Comment #: 34**

**Commenter: Saric**

Data evaluations indicate that the trends based on wet-weight PCBs overstate the rate of decline in carp and smallmouth bass tissue samples. Lipid content was found to explain a significant portion of the PCB decline. Therefore, much of the apparent decay of PCBs in tissue is explained by temporal variation in lipid content (see Figure 1 for carp, below). Extrapolation of wet-weight PCB decay trends requires the assumption that lipid content trends will continue to decline through time as well. However, it is not possible for lipids to decline below species-specific minimums; therefore, PCB trend calculations need to consider and compensate for lipid trends. A reasonable approach for future projections is to simply assume that, over time, lipid content will fluctuate between temporary high or low levels, but generally center on a long-term average lipid value. This may be best estimated from the long-run average lipid content within the monitoring data. For this analysis, all fish tissue data were standardized to a common lipid value given by the average lipid content observed in the data for each species from 1993 through 2011. The approach provides a long-term exposure trajectories that reflect PCB concentrations associated with the long-term average lipid level. The lipid-adjusted values are calculated by regressing log (PCB) on log (lipids), calculating the expected PCB concentration for the selected lipid content, and then adding the regression residuals to the expected PCB values. The values represent a sample of fish tissue values, all of which contain the same lipid content. The approach is the mathematical equivalent to selecting fish for analysis with similar lipid levels, and should be used for development of temporal trends in PCB fish tissue concentration.

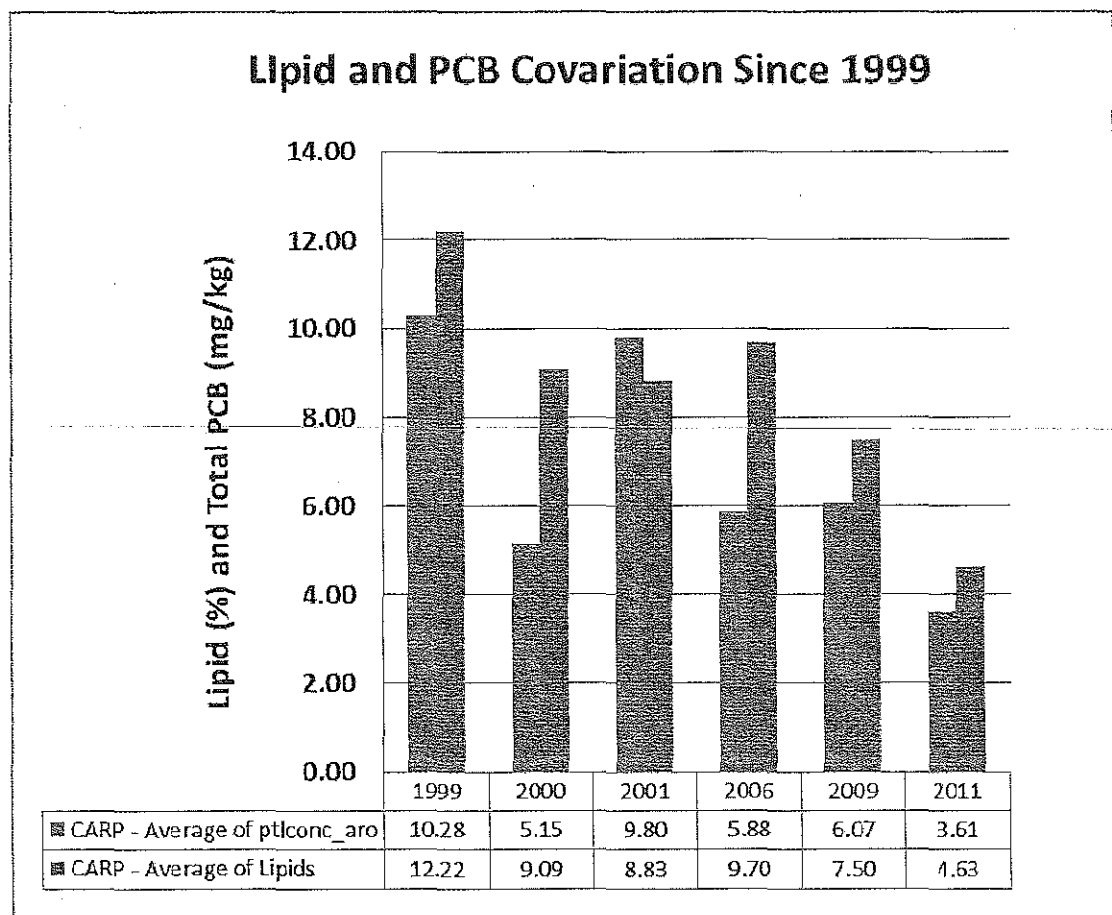


Figure 1 - Temporal decline in wet-weight PCB and lipid content in carp fillets from Kalamazoo, Mosel, and D-Avenue sampling stations.

Commenting Organization: EPA  
General Comment #: 35

Commenter: Saric

After adjusting for co-variation with lipid, temporal trends in tissue PCB concentrations were on the order of 3 percent per year (Table 1, below) as compared to 6 percent reported in the FS. Assuming the decay rates would continue indefinitely into the future, time horizons to even minimally protective fish tissue concentrations (for example, Central Tendency Sport Angler, 100 percent smallmouth bass diet, tissue level of 0.2 mg/kg ) are on the order of 30 or more years as opposed to the much shorter time horizons reported in the FS. Further, fitting a mixed order model to fish tissue data indicated that decay rates are slowing with time, in turn, indicating that the assumption of indefinite first-order decay rates represents optimistic forecasts. Given this analysis, although EPA believes that use of the first-order decay model is appropriate, the temporal trend of 3 percent per year (as described in Table 1 below) more accurately reflects PCB fish temporal trends in tissue PCB concentrations and should be used in all future remedy calculations when revising the FS report.

Table 1 - Regression function parameter estimates for temporal models.

	Variable	Parameter Estimate	Standard Error	t Value	Pr >  t	Squared Semi-partial Correlation
Carp Fillets	Intercept	47.00	18.67	2.52	0.01	.
	Year	-0.02	0.01	-2.53	0.01	0.03
	Log Lipids	0.92	0.07	12.72	<.0001	0.64
						Adjusted R <sup>2</sup> =0.70
Smallmouth Bass Fillets	Intercept	42.00	20.11	2.09	0.04	.
	Year	-0.02	0.01	-2.12	0.04	0.02
	Log Lipids	0.79	0.08	9.34	<.0001	0.39
						Adjusted R <sup>2</sup> =0.61
Whole-body YOY Smallmouth Bass	Intercept	74.87	22.22	3.37	0.00	.
	Year	-0.04	0.01	-3.45	0.00	0.10
	Log Lipids	1.11	0.13	8.64	<.0001	0.60
						Adjusted R <sup>2</sup> =0.80

Commenting Organization: EPA  
General Comment #: 36

Commenter: Saric

Methods used to estimate SWAC in Area 1 incorrectly combined “judgmentally located” (that is, biased) samples with unbiased samples, understating the average PCB concentration in surface sediments by up to a factor of 9. The estimation bias is caused by the following: (1) incorrect handling of data generated through post-hoc identification of hot-spot investigation areas; and (2) improperly combining biased and unbiased data within stream tubes in “non-hot-spot” areas. To avoid this problem of combining biased and unbiased data for wide-ranging terrestrial species, it was agreed in the EPC work group meetings that only unbiased data would be used to estimate SWACs. The same rationale suggests that unbiased sample data should also be used for estimation of PCB exposure (that is, SWAC) for wide-ranging aquatic species, including smallmouth bass and common carp.

Table 2 highlights the differences in SWAC values based on stream tubes, unbiased 1993/1994 data, and all unbiased data. Taken together, it is recommended that the SWAC estimates reported in the Area 1 FS be replaced with estimates based on the arithmetic average of unbiased samples. Samples collected in 1993/1994 may represent the most unbiased samples. However, transect-based, apparently unbiased, sampling programs were also conducted in 2000 and 2007. However, it is unclear whether the spatial extent and balance is similar to that obtained in 1993/1994, so uncritical use of the samples may also cause unintended biases. Georgia-Pacific must revise their SWAC calculations using unbiased data, as the stream tube

method appears to be underestimating SWAC values within each river area. EPA requests that Georgia-Pacific work with EPA and the Michigan Department of Environmental Quality in developing a new methodology for SWAC calculations to be incorporated into the revised FS.

**Table 2 - Total PCB Concentration in surficial sediments.**

Table 2 - Total PCB Concentration in surficial sediments.												
SRI Reach	Supplemental FS			MDEQ Analysis								
	Stream Tube			Unbiased Samples (1993-1994)					All Unbiased Samples (1993-2007)			
	N	SWAC (mg/kg)		Sample Count	SWAC (mg/kg)	LCL 95	UCL 95	Thiessen Poly SWAC (mg/kg)	N	SWAC (mg/kg)	LCL 95	UCL 95
Morrow Dam to King Highway	1	85	0.072	80	0.19	0.10	0.41	0.12	97	0.17	0.09	0.30
King Highway to Portage Creek	2	29	0.26	41	2.41	0.18	10.63	4.42	66	4.30	0.50	9.38
Portage Creek to Mosel Ave	3	30	0.35	17	2.91	0.30	13.18	4.95	50	1.30	0.36	3.87
Mosel Ave to D-Ave	4	130	0.43	81	1.24	0.34	4.64	4.66	139	0.94	0.36	2.38
D-Ave to RR Bridge	5	110	0.31	65	0.42	0.25	0.77	0.67	89	0.51	0.30	0.82
RR Bridge to Plainwell No 2.	6	24	1.1	9	0.24	0.09	0.47	0.45	18	0.30	0.15	0.50
Plainwell No2. to Main Street Plainwell	7	39	0.96	8	0.78	0.18	2.46	1.39	52	1.72	0.46	4.39

**Commenting Organization: EPA**  
**General Comment #: 37**

**Commenter: Saric**

Given the issues identified above in comments 34, 35, and 36, it appears that the SWACs are higher in each sub-area of the Kalamazoo River than presented in the draft FS report. In addition, the PCB fish tissue decay rates are lower than presented in the draft FS report. It also appears and is supported by information in the FS that river sections 1, 2, and 3 have the highest SWACs and have defined PCB hot spots. Therefore, in the revised FS report Georgia-Pacific should present additional sediment remedies using RALs of 2, 5, and 10 mg/kg within sub-areas 1, 2, and 3 and compare them against the other sediment alternatives.

## SPECIFIC COMMENTS

Commenting Organization: EPA  
Section: ES Page #: ES-1  
Specific Comment #: 1

Commenter: Saric  
Lines #: NA

Before the last sentence, insert the following. "Consistent with the 2007 AOC, the Agencies provided comments on the ASTM but the document was never approved. The revised ASTM is incorporated into the FS report."

Commenting Organization: EPA  
Section: ES Page #: Table ES-1  
Specific Comment #: 2

Commenter: ORC  
Lines #: last line of table

Replace the last line in the third column with "TBD" regarding Allied Paper, Inc. Operable Unit.

Commenting Organization: EPA  
Section: ES Page #: Table ES-2  
Specific Comment #: 3

Commenter: ORC  
Lines #:

Sediment alternatives: As discussed below, SED-1, 2, 3A, 3B, and 4A would not achieve ARARs as currently described in the FS.

SED-1 and 2: Leaves PCBs exceeding 50 mg/kg at the surface and subsurface in hot spot areas of sediment. The FS does not address how the alternative would meet TSCA risk standards.

SED-3A and 3B: Leaves PCBs that exceed 50 mg/kg in subsurface sediments. The FS does not address how remobilization of the PCBs will be prevented or how the alternatives would meet TSCA risk-based disposal standards.

SED-3A and 4-A: The FS does not explain how capping crown vantage sediments will comply with federal and Michigan floodplain and wetland requirements.

The Kalamazoo River is currently impaired for PCBs. None of the sediment alternatives describe how the remedial activities will comply with Michigan water quality standards.

Commenting Organization: EPA  
Section: ES Page #: ES-5  
Specific Comment #: 4

Commenter: ORC  
Lines #: NA

Please rewrite as follows:

Low-level continuing sources of PCBs from the atmosphere, upstream areas, urbanized areas of the watershed, and unremediated Area 1 sediments and floodplain soils may ultimately limit the lowest achievable levels of PCBs in fish and surface water.

Commenting Organization: EPA  
Section: ES Page #: ES-6  
Specific Comment #: 5

Commenter: Saric  
Lines #: NA

In the second to last sentence of the first paragraph, include language that describes which avian species, based upon egg studies (that exist at the site), are at risk in the floodplains. Delete the sentence that states it is unlikely that local populations are adversely affected by PCBs in floodplain soil under current conditions.

Commenting Organization: EPA  
Section: ES Page #: ES-6 - First full paragraph  
Specific Comment #: 6

Commenter: ORC  
Lines #: NA

Please add the following to this paragraph: "Existing levels of PCBs are not protective for any occupancy of any building within the floodplains under TSCA."

Commenting Organization: EPA  
Section: ES Page #: ES-6  
Specific Comment #: 7

Commenter: ORC

Please strike the following language as it is not wholly accurate, and it is not necessary:

"There are no established cleanup goals for PCBs in sediments or floodplain soils in relevant state or federal rules or guidance. Therefore,"

Commenting Organization: EPA  
Section: ES Page #: ES-7  
Specific Comment #: 8

Commenter: Dillon  
Lines #: NA

The fourth sentence of the first full paragraph of the page reads, "Based on this evaluation, PCB PRGs of 11 and 18 mg/kg were selected for floodplain soils."

Change the text to read, "Based on this evaluation, a PCB PRG of 11 mg/kg was selected for floodplain soils and is assumed to be protective of maximally exposed wildlife."

Commenting Organization: EPA  
Section: Figure ES-2 Page #: ES-12  
Specific Comment #: 9

Commenter: Dillon  
Lines #: NA

Fish consumption advisories are not adequate institutional controls and are one of the reasons that remediation work has been conducted in Area 1.

Commenting Organization: EPA  
Section: Figure ES Page #: ES-12  
Specific Comment #: 10

Commenter: Saric  
Lines #: NA

Figure ES-5 only indicates time duration to meet the 0.33 ppm; however, this number is not protective. The time to reach the fish consumption advisories needs to be illustrated. Further,



the timeframes should be reported from end of construction. The figure indicates completion of SED-3 A/B and SED-4 and SED-5, 6 to 7 years from the ROD date, which is unrealistically long.

Commenting Organization: EPA

Commenter: ORC

Section: ES

Page #: ES-14

Specific Comment #: 11

Please rewrite paragraph as follows:

*Reduction of hot spot PCB mass A:* One of the rationales for considering targeted hot spot removal alternatives (that is, SED-3A/3B through SED-5A/5B), is CERCLA's statutory preference for remedial actions that permanently and significantly reduce the volume, toxicity or mobility of the hazardous substances. Another rationale for consideration of the hot spots is inventory reduction in areas that, although historically stable to a large degree, could become remobilized due to various factors. The alternatives mitigate the possible remobilization and the potential consequence of mobilization which, if mobilized during a major flow event, would likely result in further impairment of the Kalamazoo River, which is currently impaired for PCBs and potential further impairment of Lake Michigan. ~~i- It is notable that these deposits have been present through a period that has included several high flow events, including a high flow event in September 2008 that was approximately a 25-year return frequency event on the Kalamazoo River, and a 100-year return frequency event on Portage Creek (ARCADIS 2012).~~

Commenting Organization: EPA

Commenter: ORC

Section: ES

Page #: ES-14

Lines #: NA

Specific Comment #: 12

Please strike the following sentence: *All sediment alternatives comply with all ARARs, with the exception of the Michigan NREPA water quality criteria*, which would require a technical implementability waiver.

Commenting Organization: EPA

Commenter: Saric

Section: Table ES-3

Page #: ES-17

Lines #: NA

Specific Comment #: 13

Floodplain Alternative FP-1 is not protective because there is risk to ecological receptors in the floodplains under current conditions.

Commenting Organization: EPA

Commenter: Saric

Section: ES

Page #: ES-18

Lines #: NA

Specific Comment #: 14

The first bullet should be completely deleted or rewritten because the RI indicates that risks to the floodplain exist, and the assumption that the adverse impacts of FP-7 are similar to others is not true.

Commenting Organization: EPA

Commenter: Saric

Section: ES

Page #: ES-18

Lines #: 9

Specific Comment #: 15

In the third bullet, the 2007 AOC for the TCRA will not provide for long-term institutional controls in the former Plainwell Impoundment. The ROD will address this.

Commenting Organization: EPA

Commenter: ORC

Section: ES

Page #: ES-18, second, third, fourth paragraphs

Lines #: NA

Specific Comment #:16

Delete the second paragraph: All of the alternatives are not equally reliable to maintain protectiveness over the long term.

Delete the third paragraph and replace with: Institutional controls are not currently in place to address any present or potential future nonrecreational uses of the floodplain areas. For all floodplain areas that exceed TSCA high-occupancy cleanup levels, environmental covenants would need to be implemented to prohibit occupiable buildings and nonrecreational uses. Operation and maintenance will be required for all alternatives that rely on armoring of banks or other means to prevent contaminants entering the river.

Rationale: The 2007 AOC is not an existing institutional control. Operation and maintenance of the final remedy to be selected for Area 1 is not governed by the 2007 AOC. EPA intends to use CERCLA Section 122 special notice procedures for a remedial design/remedial action Consent Decree to implement the ROD remedy and operation and maintenance of the remedy.

Rewrite the fourth paragraph as follows: ~~It is anticipated that all federal and state ARARs could be met during implementation of FP-1 through FP-7.~~ All of the floodplain soil alternatives are also implementable, and the proposed techniques for construction have been used successfully at other sites and within Area 1.

Rationale: FP-1 is not in compliance with ARARs, and there is no demonstration that Michigan water quality standards would be met with FP-1. Among other things, FP-2 through FP-6 would require environmental covenants and governmental controls prohibiting occupiable buildings and nonrecreational use in order to be compliant with TSCA and Michigan Part 201. TSCA requires deed restrictions for areas with caps or cleanup levels above 2.5 ppm PCBs. MCL 324.20120b requires restrictive covenants for cleanups that are not protective of residential use. The FS should discuss how FP-2 through FP-7 will achieve Michigan water quality standards within a reasonable time period. Floodplain capping alternatives do not currently discuss how they would meet Michigan floodplain and wetlands requirements and the Clean Water Act.

Commenting Organization: EPA

Commenter: ORC

Section: ES

Page #:ES-18

Lines #: Last bulleted paragraph

Specific Comment #: 17

Delete the following paragraph:

*The increased cost – and associated increased scope and adverse impacts – of the active floodplain alternatives do not significantly increase protectiveness over current conditions, which are already protective.* This is demonstrated in Figure ES-7, which shows the percent of home ranges below the lowest recommended PRG (11 mg/kg) against the estimated cost for each floodplain soil alternative.

Commenting Organization: EPA  
Section: ES Page #: ES-19  
Specific Comment #: 18

Commenter: Saric  
Lines #: 8

The conclusions are misleading and should be eliminated from the Executive Summary.

Commenting Organization: EPA  
Section: ES Page #: ES-20  
Specific Comment #: 19

Commenter: ORC

Delete the sixth paragraph concerning institutional controls.

Commenting Organization: EPA  
Section: ES Page #: Table ES-3  
Specific Comment #: 20

Commenter: ORC

Revise the table to reflect that FP-1, 2, 3, 4, 5, and 6, as described, do not meet ARARs. The floodplains currently exceed TSCA cleanup standards for occupancy use, and land use restrictions are not in place. The FS (as written) does not identify existing and proposed institutional controls for all alternatives that would leave PCBs that exceed 2.5 ppm in place. Floodplain capping alternatives do not currently discuss how they would meet Michigan floodplain and wetlands requirements and the Clean Water Act Section 404 requirements.

Commenting Organization: EPA  
Section: 1 Page #: 1-1  
Specific Comment #: 21

Commenter: ORC  
Lines #: 2<sup>nd</sup> paragraph

Please change as follows:

As specified in the supplemental RI/FS AOC, and consistent with the National Oil and Hazardous Substances Pollution Contingency Plan (NCP; 40 *Code of Federal Regulations* [CFR] 300.430(e)(6) the purpose of this Area 1 FS report is to identify and evaluate remedial alternatives that protect human health and the environment by preventing, eliminating, reducing, or controlling any release or threatened release of hazardous substances, pollutants, or contaminants at or from the site. This Area 1 FS report was prepared in accordance with EPA's *Contaminated Sediment Remediation Guidance for Hazardous Waste Sites* (EPA 2005b) and the *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA* (EPA 1988a), and *CERCLA Compliance with Other Laws Manual, Parts I and II* (EPA 1988b; EPA 1989).

Commenting Organization: EPA  
Section: 1.1 Page #: 1-4  
Specific Comment #: 22

Commenter: Saric  
Lines #: NA

First paragraph, last sentence—Insert the following sentence at the end: “Consistent with the 2007 AOC, the Agencies provided comments on the ASTM, but the document was never approved. The revised ASTM is incorporated into the FS report.”

Commenting Organization: EPA  
Section: 1.2 Page #: 1-6, 1-7  
Specific Comment #: 23

Commenter: White  
Lines #:

“The available data indicate that exposure to PCBs will drive risks at the site, and that management of risks due to PCB exposure will also address risks associated with other constituents.” Georgia-Pacific’s response to EPA General Comment #1 on the ASTM indicated that the Area 1 FS report would include a discussion of non-PCB constituents and would describe how the reduction of the constituents would be documented. The discussion in the draft FS report cites the co-occurrence evaluation provided in Appendix M of the Area 1 supplemental RI report, but does not address how the remedial alternatives will reduce concentrations of non-PCB constituents.

Commenting Organization: EPA  
Section: 1.2 Page #: 1-7  
Specific Comment #: 24

Commenter: Saric  
Lines #: 8-9

In the first paragraph, the discussion of stressor identification and the rationale for only focusing on PCBs for ecological risk assessment should be further explained. Also, there is no discussion of PCBs being the primary human health risk driver, which should be discussed further in this section as well.

Commenting Organization: EPA  
Section: 2 Page #: 2-1  
Specific Comment #: 25

Commenter: White  
Lines #:

First bullet – “Due to conservatism and uncertainty associated with RBC calculations, exceedances of the lower range of RBCs do not necessarily indicate that receptors are not protected.” Either delete this sentence or include a more comprehensive discussion of the uncertainties associated with the RBCs developed for Area 1.

Commenting Organization: EPA  
Section: 2 Page #: 2-2  
Specific Comment #: 26

Commenter: ORC  
Lines #:

Please delete the following language:

There are no established cleanup goals for PCBs in sediments in relevant state or federal rules or guidance; therefore,

Commenting Organization: EPA  
Section: 2.1.1 Page #: 2-2

Commenter: White  
Lines #:

**Specific Comment #: 27**

Add Table 8-7 from the Area 1 supplemental RI report (Risk-Based Concentrations for Fish and Sediments Derived by CDM [2003b] Based on the Angler Scenarios Evaluated in the CDM HHRA), and text to summarize how the RBCs were derived. Add more discussion in this section about the level of human health protection that is expected to be achieved, and justification for why a lower PRG (that is, a PRG that would achieve a higher level of human health protection) was not selected.

**Commenting Organization: EPA**

**Commenter: White**

**Section: 2.1.2**

**Page #: 2-3**

**Lines #:**

**Specific Comment #: 28**

"While the hot spots do not have a significant impact on the Area 1-wide SWAC due to their small size and therefore limited opportunity for exposure/risk reduction, they do contain inventories of PCBs that could potentially remobilize if the deposits were not stable during future conditions." This sentence implies that the rationale for targeting hot spots is to address RAO 4 rather than RAOs 1 and 2. However, the scale of evaluation in the FS (area-wide SWAC) is too large to evaluate exposure and potential risk reduction. Revise this paragraph to indicate that the rationale for developing and evaluating remedial alternatives for hot spot areas is to address RAOs 1, 2, and 4. Further, evaluate the hot spot removal and impact upon SWACs based upon the eight Area 1 sub-sections as defined in the RI report.

**Commenting Organization: EPA**

**Commenter: Dillon**

**Section: 2.2**

**Page #: 2-6**

**Lines #: NA**

**Specific Comment #: 29**

The second paragraph of the section states, "This evaluation considers the potential PRGs and a range of RALs to identify whether or not a remedial action in the Target Areas would result in a significantly higher level of protection beyond the current post-removal action conditions for ecological receptors in the TCRA areas."

Edit the text to say, "This evaluation considers the potential PRGs and a range of RALs to identify an appropriate PRG and RAL that can be used to meet RAO 3 and evaluate risk reduction for ecological receptors beyond the current post-removal action conditions for target areas."

**Commenting Organization: EPA**

**Commenter: Dillon**

**Section: 2.2.1**

**Page #: 2-7**

**Lines #: NA**

**Specific Comment #: 30**

The last two sentences of the second paragraph read, "Based on the range of potential PRGs and their relative confidence, in combination with the detailed RAL analysis presented in Section 5.2.2 of the Area 1 ASTM, the lowest dietary RBCs from the Area 1 TBERA (i.e., based on the shrew) are proposed as PRGs. The lowest observable adverse effect level (LOAEL)-based RBC for shrews is 18 mg/kg, and the geometric mean of the no observable adverse effect level (NOAEL) and LOAEL is 11 mg/kg PCB. While the LOAEL is often considered a reasonable estimate when addressing population-level effects, for conservatism, both the LOAEL and the

geometric mean values have been carried forward as floodplain soil PCB PRGs for this Area 1 FS Report.”

Change the text to read, “Based on the range of potential PRGs and their relative confidence, in combination with the detailed RAL analysis presented in Section 5.2.2 of the Area 1 ASTM, the lowest dietary RBCs from the Area1 TBERA (that is, based on the shrew) were selected to derive the proposed as PRG. The proposed PRG for floodplain soils to be adopted in the FS is 11 mg/kg PCBs. This PRG is the geometric mean of the no observable adverse effect level (NOAEL) and lowest observable adverse effects level (LOAEL) and is considered a reasonably conservative estimate of the potential toxicity threshold that would be protective of maximally exposed wildlife species. Based on the analysis in the ASTM, this RBC is shown to be protective of 94-percent of the home ranges for maximally-exposed mammalian receptors such as the shrew. The RBC of 11 mg/kg PCBs is also assumed to be protective of avian receptors as it represents a balance between risk and uncertainty surrounding the various methodologies and assumptions for calculating risk to avian receptors employed in the TBERA.”

Commenting Organization: EPA

Section: 2.2

Page #: 2-7

Specific Comment #: 31

Commenter: Saric

Lines #: NA

Define the species that would be protective and the percentage of home ranges assuming removal of material consistent with a RAL of 20 ppm. Further, a RAL of 0.5 ppm was included based upon EPA’s request as it would ensure protectiveness for avian species with RBCs less than 1 ppm.

Commenting Organization: EPA

Section: 2.2.2

Page #: 2-8

Specific Comment #: 32

Commenter: Saric

Lines #: NA

The target RAL of 20 ppm should include the percentages of species both protected and not protected.

Commenting Organization: EPA

Section: 2.2.2

Page #: 2-8

Specific Comment #: 33

Commenter: Dillon

Lines #:

As discussed in the general comments, any reference to an 80 percent target of home ranges and a PRG other than 11 mg/kg PCBs should be removed.

Commenting Organization: EPA

Section: Figure 2.2.2

Page #: 2-8

Specific Comment #: 34

Commenter: Dillon

Lines #:

To be consistent with the presentation in Section 2.2.3, a table should be added similar to Table 2-3 showing the results under the RAL of 20 mg/kg PCB.

Commenting Organization: EPA

Section: 2.2.2

Page #: 2-8

Commenter: Saric

Lines #: NA

**Specific Comment #: 35**

Add the following to the last paragraph: Excavating to a depth of 5 ppm may be appropriate to prevent contaminated material deeper than one foot from being brought to the surface in the future from such natural process as fallen trees, burrows, etc. Further, given the proximity of the floodplain material to the bank of the Kalamazoo River in the former Plainwell Impoundment, removal of the material would prevent contaminated material from entering the river if lateral migration of the river was to occur.

**Commenting Organization: EPA**

**Section: 2.3.1**

**Page #: 2-10**

**Commenter: White**

**Lines #:**

**Specific Comment #:36**

Footnote 2 in Table 2-4 is not defined.

**Commenting Organization: EPA**

**Section: 3**

**Page #: 3-1**

**Commenter: White**

**Lines #:**

**Specific Comment #:37**

Last sentence – "... [SED-2 and FP-2] will be evaluated against the evaluation criteria listed above except for reduction in toxicity, mobility or volume through treatment." Every alternative must be evaluated for all of the balancing criteria, even if no reduction in toxicity, mobility, or volume through treatment is achieved.

**Commenting Organization: EPA**

**Section: 3.1**

**Page #: 3-1, 3-2**

**Commenter: White**

**Lines #:**

**Specific Comment #: 38**

Overall protection of human health and the environment – for RAOs 1 and 2, the time frame over which reductions in sediment and fish tissue PCB concentrations are expected to occur should be included in this overall evaluation. For floodplain soils, RAO 4 should also be evaluated by assessing the degree to which the alternative reduces PCB loading from the river banks and floodplain to the channel.

**Commenting Organization: EPA**

**Section: 3.2**

**Page #: 3-2**

**Commenter: Saric**

**Lines #: NA**

**Specific Comment #: 39**

The human health-based AWQC of 0.064 ppt should be included as an ARAR.

**Commenting Organization: EPA**

**Section: 4**

**Page #: 4-21 Section 4.1.3.2 Compliance with ARARs**

**Commenter: ORC**

**Specific Comment #: 40**

Third Paragraph: Add Section 303(d) of Clean Water Act – Total Maximum Daily Loads to Area 1 sediment ARARs.

Delete last partial paragraph regarding technical impracticability waiver.

Commenting Organization: EPA  
Section: 3.4 Page #: 3-3  
Specific Comment #: 41

Commenter: White  
Lines #:

Delete the last sentence in Section 3.4. Reduction in toxicity, mobility, and volume through treatment should be evaluated for every alternative (this comment also applies to the last sentence in the first paragraph of Section 4.1).

Commenting Organization: EPA  
Section: 4.1.1 Page #: 4-3  
Specific Comment #: 42

Commenter: White  
Lines #:

First paragraph – expand the definition of dynamic equilibrium to indicate that erosion and deposition occur within the channel, but result in no net sediment accumulation or loss over time.

Commenting Organization: EPA  
Section: 4 Page #: 4-3  
Specific Comment #: 43

Commenter: Saric

Performance is not only measured by the ability of Area 1 to meet the 0.33 ppm PRG, but also obtain the one meal per week for bass with a fish tissue level of 0.2 ppm.

Commenting Organization: EPA  
Section: 4.1.1 Page #: 4-6  
Specific Comment #: 44

Commenter: White  
Lines #:

Please present the fish tissue PCB data in Figure 4-3 on a lipid-normalized basis. The text discusses time-series plots of lipid-normalized PCB data, but the plots presented in Figure 4-3 report wet weight data.

Commenting Organization: EPA  
Section: 4.1.1 Page #: 4-5  
Specific Comment #: 45

Commenter: Saric

It should be clearly stated and supported that, based upon the last 4 years of surface water monitoring data, the PCB contribution from sources upstream of the Morrow Dam are believed to contribute 20 percent of the PCB surface water contribution and Portage Creek contributes another 40 percent of PCB surface water contribution. However, when the Portage Creek TCRA is completed, the Portage Creek contribution is expected to decrease.

Commenting Organization: EPA  
Section: 4.1.1 Page #: 4-6  
Specific Comment #: 46

Commenter: White  
Lines #:



Second paragraph – this paragraph states that erosion of buried sediments and PCBs in Area 1 is unlikely because a hot spot was present at the same location in the river channel before and after a 25-year storm event that occurred in 2008. This observation alone is insufficient to conclude that all buried sediments and PCBs in Area 1 are stable under high-flow conditions. Please provide a more rigorous analysis of sediment stability, including consideration of a 100-year storm as recommended in EPA's Contaminated Sediment Remediation Guidance (2005). This comment also applies to Section 4.1.3.3.1 and Section 4.2.3, Adequacy of Control Measures.

Commenting Organization: EPA

Commenter: White

Section: 4.1.1

Page #: 4-6

Lines #:

Specific Comment #: 47

Include an analysis of channel stability in the description of current river conditions (for example, based on time-series aerial photograph analysis of channel configuration as an indication of long-term stability; erosion pin survey data as an indicator of short-term stability).

Commenting Organization: EPA

Commenter: White

Section: 4.1.1

Page #: 4-6

Lines #:

Specific Comment #: 48

Third paragraph – “Following control of all external paper industry-related sources of PCBs in Area 1 . . .” (underline added) – PCBs from historical paper-making operations that remain in unremediated channel sediments and floodplain soils in Area 1 will continue to influence PCB concentrations in fish tissue. Revise this paragraph accordingly. In addition, please clarify the meaning of the second sentence (“ . . . fate and transport processes internal to Area 1 along with habitat and biological factors will govern the extent and temporal response of PCB levels in fish tissue.”)

Commenting Organization: EPA

Commenter: White

Section: 4.1.2.2

Page #: 4-7

Lines #:

Specific Comment #: 49

All of the sediment alternatives, except SED-1, include MNR as a key component of the remedy; however, the description of MNR processes is limited to one sentence. Either in this section or in the CSM, provide more detail about recovery processes and expected recovery rate.

Commenting Organization: EPA

Commenter: White

Section: 4.1.2.2

Page #: 4-7

Lines #:

Specific Comment #: 50

Section 6.3.3 of the ASTM indicates that thin-layer capping was retained as a representative process option for enhanced MNR to address post-removal residual contamination. Would enhanced MNR also be effective in other portions of Area 1 (for example, the unremediated portion of Portage Creek; former Plainwell Impoundment and Plainwell No. 2 area) given that recovery rates are expected to be slow? Add text to indicate that enhanced MNR (thin layer capping) in selected areas may be included as a component of the remedy.

Commenting Organization: EPA  
Section: 4.1.2.2 Page #: 4-8  
Specific Comment #: 51

Commenter: White  
Lines #:

Long-term monitoring will be a key component of the Area 1 remedy because every alternative under consideration relies on MNR. The LTM program should include sediment, surface water and fish tissue sampling as well as an assessment of channel stability to better understand how the river system is recovering and evaluate whether the RAOs have been achieved.

Commenting Organization: EPA  
Section: 4.1.3 Page #:  
Specific Comment #: 52

Commenter: White  
Lines #:

The tables summarizing the detailed evaluation of remedial alternatives will need to be updated after the specific comments are addressed.

Commenting Organization: EPA  
Section: 4.1.3.1 Page #: 4-17  
Specific Comment #:53

Commenter: White  
Lines #:

Second paragraph – “These future fish tissue PCB concentration projections were then used to calculate associated human health and ecological risks over time.” It would be simpler and easier to understand to compare the projected fish tissue concentrations to RBCs and fish tissue advisory levels.

Commenting Organization: EPA  
Section: 4.1.3.1.1 Page #: 4-18  
Specific Comment #: 54

Commenter: White  
Lines #:

Third paragraph – “Thus, reduction of PCB levels in Area 1 sediments and fish is expected to result in achievement of RAOs 1 and 2 . . .” This section needs to be specific about the level of protection that will be achieved and the time frame that will be required.

Commenting Organization: EPA  
Section: 4.1.3.1.1 Page #: 4-18  
Specific Comment #: 55

Commenter: White  
Lines #:

The discussion of RAO 4 addresses only water column transport. Also evaluate future loading to the river channel from river banks and floodplains, and sediment transport within the channel. This comment applies to the description of every remedial alternative.

Commenting Organization: EPA  
Section: 4.1.3.1.1 Page #: 4-19  
Specific Comment #:56

Commenter: White  
Lines #:

First sentence – delete RAO 2, and change “ . . . the continuation of fish consumption advisories can protect human health” to “ . . . fish consumption advisories would be used to facilitate human health protection.”

Commenting Organization: EPA

Commenter: White

Section: 4.1.3.1.1

Page #: 4-19

Lines #:

Specific Comment #: 57

Second paragraph – “ . . . however, there may be limitations on the lowest achievable levels in fish due to low-level continuing sources of PCBs.” This paragraph should be more specific about the range of tissue PCB concentrations and level of protection that are expected to be achieved.

Commenting Organization: EPA

Commenter: White

Section: 4.1.3.1.2

Page #: 4-19

Lines #:

Specific Comment #: 58

First paragraph – “Removal of PCB-containing sediments . . . may support the reduction in PCB levels in fish over time (RAOs 1 and 2).” Change “may” to “will.”

Commenting Organization: EPA

Commenter: ORC

Section: 4

Page #: 4-21, 22

Lines #:

Specific Comment #: 59

Please rewrite as follows:

Federal Toxic Substances Control Act (TSCA) (40 CFR Part 761), specifically 40 CFR 761.61, requirements for disposal of PCB remediation waste.-

1. Federal Clean Water Act (CWA) [please note that these may be considered relevant and appropriate, but are not applicable as they are non-enforceable guidelines] section 301 and 40 C.F.R. Part 131 are applicable to contaminants found at the Site that may enter surface water and are not addressed under state standards. The Kalamazoo River is impaired for PCBs; as such, pursuant to section 303(d) of the CWA, the State of Michigan is developing a Total Maximum Daily Load (TMDL) for PCBs.
2. Michigan Natural Resources and Environmental Protection Act (NREPA) surface water quality requirements for surface waters in the State, specifically the Michigan Part 31 water quality standards for the protection of human health ( $2.6 \times 10^{-5}$  µg/L) and wildlife (0.00012 µg/L).

Commenting Organization: EPA

Commenter: ORC

Section: 4

Page #: 4-22

Lines #:

Specific Comment #: 60

Please rewrite as follows:

4.1.3.2.1 MNR – Compliance with Action-Specific ARARs Federal Toxic Substances Control Act (TSCA) (40 CFR Part 761), specifically 40 CFR 761.61, requirements for disposal of PCB remediation waste applies to any PCB remediation waste left onsite.

**Commenting Organization:** EPA

**Commenter:** White

**Section:** 4.2.1

**Page #:** 4-33

**Lines #:**

**Specific Comment #:** 61

First paragraph, last sentence – “Now that significant source control has been completed, future rates of recovery may be expedited.” Change “may be expedited” to “may change.” As the major sources of PCBs to fish are controlled, the PCB attenuation rate in fish tissue is more likely to slow down given the expected slow recovery rate for sediments.—

**Commenting Organization:** EPA

**Commenter:** White

**Section:** 4.2.1

**Page #:** 4-33

**Lines #:**

**Specific Comment #:** 62

Second paragraph – “Furthermore, it should be noted that the calculations presented herein do not average exposures which are already declining.” Please revise this sentence to clarify its meaning.

**Commenting Organization:** EPA

**Commenter:** White

**Section:** 4.2.1

**Page #:** 4-33

**Lines #:**

**Specific Comment #:** 63

RAO 1 – the plots in the Figure 4-4 and 4-5 series require explanation before presenting the results. The explanatory information in Appendix E should be incorporated into the main text. Alternatively, the plots could be revised to simplify and clarify the presentation.

**Commenting Organization:** EPA

**Commenter:** White

**Section:** 4.2.3

**Page #:** 4-38

**Lines #:**

**Specific Comment #:** 64

Second paragraph – “These efforts and processes have resulted in substantial long-term declines in PCB concentrations in surface water and fish tissue . . . ” Add specific estimates of the long-term declines in surface water and fish tissue.

**Commenting Organization:** EPA

**Commenter:** ORC

**Section:** 4

**Page #:** 4-38

**Specific Comment #:** 65

Delete second sentence in 4.2.2 regarding technical impracticability waiver. It is unlikely that Michigan Part 31 water quality standards would be achieved using SED-1. The FS needs to demonstrate how SED-2 through SED-6 would comply with water quality standards over time.

**Commenting Organization:** EPA

**Commenter:** White

**Section:** 4.2.3

**Page #:** 4-39

**Lines #:**

**Specific Comment #:** 66

First full paragraph, last sentence – “. . . and thereby may reduce future exposures or inventory in areas that although historically stable to a large degree, could become remobilized.” Delete the phrase “that although historically stable to a large degree” – the sediment stability analysis currently presented in the FS report is insufficient to support this statement.

**Commenting Organization:** EPA

**Commenter:** White

**Section:** 4.2.3

**Page #:** 4-40

**Lines #:**

**Specific Comment #:** 67

Magnitude of residual risk – pre- and post-remedy sediment SWACS should be presented on a river section basis.

**Commenting Organization:** EPA

**Commenter:** White

**Section:** 4.2.3

**Page #:** 4-42

**Lines #:**

**Specific Comment #:** 68

Last sentence in Section 4.2.3 – additional 5-year reviews will be required if RAOs have not been achieved after 5 years.

**Commenting Organization:** EPA

**Commenter:** White

**Section:** 4.2.5

**Page #:** 4-46

**Lines #:**

**Specific Comment #:** 69

Table 4-7 – the estimated time to achieve risk targets for human health should be based on the high end sport angler scenario, which is equivalent to the RME scenario typically used by EPA for remedial decision making.

**Commenting Organization:** EPA

**Commenter:** White

**Section:** 4.2.7

**Page #:** 4-50

**Lines #:**

**Specific Comment #:** 70

Delete the paragraph below the bullets. EPA will identify the most cost-effective alternative.

**Commenting Organization:** EPA

**Commenter:** Dillon

**Section:** 5.1.1

**Page #:**

**Lines #:**

**Specific Comment #:** 71

As indicated in General Comment 19, discussion of current conditions in the floodplain should be based on individual target areas.

**Commenting Organization:** EPA

**Commenter:** Dillon

**Section:** 5.1.1

**Page #:** 5-4 and 5-5

**Lines #:**

**Specific Comment #:** 72

The last paragraph of this section should focus on describing the current conditions relative to the proposed PRG of 11 mg/kg, which is assumed to achieve RAO 3. Rewrite the text to simply describe the percent of home ranges and acreage that are considered protective and those that

are considered to pose risk to maximally exposed wildlife. Any discussion of whether RAO 3 is met under current conditions should be presented in Section 5.1.3.1 and along with the relative risk reduction discussion under each alternative.

**Commenting Organization:** EPA

**Commenter:** Saric

**Section:** 5.1.2.2

**Page #:** 5-6

**Specific Comment #:** 73

The 2007 AOC for the Plainwell TCRA does not include address institutional controls post-ROD for Area 1. The Area 1 ROD will address the requirements for future bank monitoring and institutional controls.

**Commenting Organization:** EPA

**Commenter:** Bill Andrae

**Section:** 5.1.2.3

**Page #:** 5-6

**Lines #:** Last Sentence

**Specific Comment #:** 74

Earlier in the paragraph, it is stated that common borrow material will be used as when backfilling; however, the last sentence indicates sand will be used when backfilling. Subsequent sections refer to common borrow material for backfilling. Is there a specific reason for using sand in Alternative FP-3? Is it appropriate backfill material given the issues with erosion in other floodplain soil areas?

**Commenting Organization:** EPA

**Commenter:** Dillon

**Section:** 5.1.3.1

**Page #:** 5-11

**Lines #:** NA

**Specific Comment #:** 75

Discussion of the current conditions relative to RAO 3 should be presented in this section. The discussion should address issues raised in General Comment 15 and discuss the residual risk and uncertainty acknowledging that with the PRG of 11mg/kg total PCBs that residual risk is present assuming sensitive species and the RAO is currently not achieved under that assumption.

**Commenting Organization:** EPA

**Commenter:** Saric

**Section:** 5.1.3.1.5

**Page #:** 5-14

**Specific Comment #:** 76

Bank erosion controls will be addressed in the ROD for Area 1, which includes the former Plainwell Impoundment and Plainwell 2 dam areas. Erosion is occurring in these areas, and the floodplain remedies need to address areas that could erode into the river via channel migration. The stabilization efforts need to be documented in the final remedy for the impoundments.

**Commenting Organization:** EPA

**Commenter:** ORC

**Section:** 5

**Page #:** 5-15 and 5-16

**Specific Comment #:** 77

5.1.3.2 Common Elements – Compliance with ARARs:

Second paragraph: Add 40 CFR 761.62

Page 5-16: Add paragraph discussing: For those floodplain alternatives that leave soil in place that exceeds TSCA occupancy standards: specify existing and proposed institutional controls (for example, environmental covenants for privately owned property and governmental controls for government owned property) that would prohibit occupiable buildings or other nonrecreational use. Identify contingency plans for private property owners of such property who are unwilling to execute environmental covenants.

**Commenting Organization:** EPA

**Commenter:** ORC

**Section:** 5

**Page #:** 5-15

**Specific Comment #:** 78

5.1.3.3.1: Delete second paragraph starting with "Institutional controls...."

**Commenting Organization:** EPA

**Commenter:** Dillon

**Section:** 5.2.1

**Page #:** 5-24

**Lines #:** NA

**Specific Comment #:** 79

As discussed in General Comment 15, EPA believes that it is inappropriate and premature to conclude in the FS that current conditions are adequately protective of avian species and therefore RAO 3 has been achieved. The uncertainty raised by Manning, et al. 2013 needs to be acknowledged and any discussion of current conditions need to reflect the potential risk to a sensitive avian species. The alternatives need to be evaluated accordingly.

**Commenting Organization:** EPA

**Commenter:** Dillon

**Section:** 5.2.3

**Page #:** 5-26

**Lines #:** NA

**Specific Comment #:** 80

This section needs to be revised to be consistent with previous comments. The discussion should be by target area and by percent of home ranges that show residual risk at the PRG across the range of uncertainty. Delete any reference to a specific number of home ranges protective of populations. Protection of local populations can be discussed relative to the number of and area extent of home ranges that exceed.

**Commenting Organization:** EPA

**Commenter:** Dillon

**Section:** 5.2.7

**Page #:** 5-4

**Lines #:** NA

**Specific Comment #:** 81

The discussion of cost should include the monitoring that would be necessary to support the selection of FS-1 or FS-2. The section will need to be revised to address the risk reduction relative to current conditions following modifications to address General Comment 15.

**Commenting Organization:** EPA

**Commenter:** Dillon

**Figure:** 5-1

**Page #:** 5-35

**Lines #:** NA

**Specific Comment #:** 82

The figure will need to be modified to address the issues raised in General Comment 15 and Specific Comment 81.

Commenting Organization: EPA

Commenter: White/Dillon

Section: 6

Page #:

Lines #:

Specific Comment #: 83

Update Section 6 to be consistent with the changes made in previous sections in response to these comments.

Commenting Organization: EPA

Commenter: Saric

Section: 6

Page #: 6-1

Lines #: NA

Specific Comment #: 84

In the second paragraph, delete the sentence "Based upon the conservative nature of risk estimates....." as this statement is not correct.

Commenting Organization: EPA

Commenter: Saric

Section: 6

Page #: 6-3

Lines #: NA

Specific Comment #: 85

It is inappropriate for the FS to recommend a preferred sediment alternative as discussed in the first bullet at the top of the page. Further, based upon earlier comments, SED-3A/3B may not provide the greatest benefits when comparing the various sediment remedies. Therefore, this bullet should be deleted.

Commenting Organization: EPA

Commenter: ORC

Section: 6

Page #: 6-3

Specific Comment #: 86

Delete last paragraph starting with "Institutional controls are currently in place...."

Commenting Organization: EPA

Commenter: Saric

Section: 6

Page #: 6-4

Lines #: NA

Specific Comment #: 87

It is inappropriate for the FS to recommend a preferred floodplain alternative as discussed in the first bullet at the top of the page. Further, based upon earlier comments, FP-1 is not protective. Therefore, this bullet should be deleted.

Commenting Organization: EPA

Commenter: ORC

Section: Table 3-1

Page #: Table 3-1

Specific Comment #: 88

Add the following ARARs

40 CFR 761.62: Add: Deed restrictions required for caps and cleanups leaving PCBs above 1 ppm or risk-based level for residential occupancy.



Michigan NREPA (Part 201): add the following to the Part 201 discussion. Restrictive covenants required for caps and cleanups that do not meet residential cleanup standards.

Section 303(d) of Clean Water Act and Total Maximum Daily Loads.

Clean Water Act Section 404: Section 404 would apply to capping alternatives that would fill wetland areas in the floodplains. Section 404 regulates the discharge of dredged or fill material into waters of the United States, including wetlands, through a permit process. While CERCLA remedies are exempt from permit requirements, the substantive requirements of these rules apply to the wetlands areas. Compensatory mitigations must be provided in accordance with the Section 404(b)(1) guidelines, 40 C.F.R. § 230.10(a) if any wetlands are filled. Superfund policy is to require a minimum of one acre of wetlands mitigation for each acre of wetland filled. (See "Considering Wetlands at CERCLA Sites" OSWER 9280.0-03). The Federal Mitigation Rule requires that mitigation plans include the following fundamental components: objectives; site selection criteria; site protection instruments (for example, conservation easements); baseline information (for impact and compensation sites); credit determination methodology; a mitigation work plan; a maintenance plan; ecological performance standards; monitoring requirements; a long-term management plan; an adaptive management plan; and financial assurances. (*Compensatory Mitigation for Losses of Aquatic Resources; Final Rule* 40 CFR § 230.94(c)(2-14)).

**Commenting Organization:** EPA

**Section:** Appendix A

**Page #:** ES-4

**Specific Comment #:** 89

**Commenter:** White

**Lines #:**

Bank sources, first bullet - the first sentence states "At EPA's request, an evaluation of PCB sources from remaining river banks in Area 1 is included in this Area 1 ASTM . . ." Add an assessment of the banks in the former Plainwell Impoundment and Plainwell No. 2 dam area in the analysis.

**Commenting Organization:** EPA

**Section:** Appendix A

**Page #:** ES-4

**Specific Comment #:** 90

**Commenter:** White

**Lines #:**

Bank sources, first bullet, 11<sup>th</sup> line - after the sentence reads "The remaining entire river bank PCB inventory in Area 1 would have to be almost completely eroded to equal just the annual load from the former Plainwell bank," add the following sentence: "However, ongoing erosion of PCB-containing bank soils will continue to be a source of PCBs to fish."

**Commenting Organization:** EPA

**Section:** Appendix A

**Page #:** ES-4

**Specific Comment #:** 91

**Commenter:** White

**Lines #:**

Bank sources, second bullet - "The inventory of PCBs in the remaining river bank area is small and not a significant ongoing source to the river." Revise this sentence to be specific about "small" - the inventory is small compared to what? Delete the phrase "and not a significant ongoing source to the river" because the significance of the source has not yet been established

- future monitoring will determine whether or not bank erosion is limiting the PCB attenuation rate for fish tissue.

**Commenting Organization:** EPA  
**Section:** Appendix A      **Page #:** ES5  
**Specific Comment #:** 92

**Commenter:** ORC

Delete a portion first sentence of the following paragraph:

~~There are no established cleanup goals for PCBs in sediments in relevant state or federal rules or guidance; therefore, the Site-specific risk assessments...."~~

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**Commenting Organization:** EPA  
**Section:** Appendix A      **Page #:** ES-5  
**Specific Comment #:** 93

**Commenter:** White  
**Lines #:**

Remedial Approach for Sediments - "This long-term SWAC goal will conservatively be applied to Area 1 as a whole based on the assumption that fish habitat is similar across Area 1 and fish exposure is integrated across Area 1 due to minimal barriers to fish migration." As noted in the general comments, Area 1 should be divided into sections for the purposes of evaluating long-term effectiveness of the various remedial alternatives for sediment.

**Commenting Organization:** EPA  
**Section:** Appendix A      **Page #:** 1-3  
**Specific Comment #:** 94

**Commenter:** White  
**Lines #:**

First full paragraph, last sentence - "PCBs are the only contaminants of concern (COCs) addressed in the approved risk assessments and completed remedial actions at the site." Please refer to the specific comment on Section 1.2 regarding non-PCB constituents.

**Commenting Organization:** EPA  
**Section:** Appendix A      **Page #:** 1-4  
**Specific Comment #:** 95

**Commenter:** White  
**Lines #:**

Fourth paragraph - this paragraph summarizes the TCRAs in the former Plainwell impoundment and Plainwell No. 2 dam area, and states that "these removal actions controlled sources of PCBs associated with erosion of exposed former sediments, and removed targeted floodplain soils with high PCB concentrations." As indicated in the general comments, include a map in the FS that shows the extent of the TCRA removal actions and areas of bank stabilization in the former Plainwell Impoundment and Plainwell No. 2 dam area.

**Commenting Organization:** EPA  
**Section:** Appendix A      **Page #:** 1-5  
**Specific Comment #:** 95

**Commenter:** ORC  
**Lines #:** NA

Please rewrite paragraph as follows:

As described in the AOC, Area-specific supplemental RIs/FSs are required to be developed

to supplement existing information in determining the nature and extent of contamination and any current or potential threat to the public health, welfare, or the environment posed by the release or threatened release of hazardous substances, pollutants, or contaminants at or from the site and to collect sufficient additional data for developing and evaluating effective remedial alternatives and to identify and evaluate remedial alternatives that protect human health and the environment by preventing, eliminating, reducing, or controlling any release or threatened release of hazardous substances, pollutants, or contaminants at or from the site. The investigation of the nature and extent of PCBs in Area 1 and the assessment of potential risks to human health and the environment is documented in the EPA-approved Area 1 supplemental RI report (ARCADIS 2012). The information on PCB concentrations and pathways that present risks is carried forward into this document, and the various FS-related activities to be implemented by Georgia-Pacific include examining potential general response actions (GRAs) and evaluating remedial technologies and alternatives to address remaining risk to human health and the environment. The work reflects the guidance presented in EPA's *Contaminated Sediment Remediation Guidance for Hazardous Waste Sites* (EPA 2005). The FS development activities will also be performed consistent with the *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA* (EPA 1988a) and *CERCLA Compliance with Other Laws Manual, Parts I and II* (EPA 1988b; EPA 1989) and the National Oil and Hazardous Substances . . .

Commenting Organization: EPA

Commenter: White

Section: Appendix A Page #: 2-4

Lines #:

Specific Comment #: 96

Section 2.4, 11<sup>th</sup> line – "...are supportive of the recovery of PCB levels in fish." Change "recovery" to "reduction."

Commenting Organization: EPA

Commenter: White

Section: Appendix A Page #: 3-9

Lines #:

Specific Comment #: 97

Fifth line – "The Area 1 FS will incorporate results of the monitoring program in considering the permanence and effectiveness of the removal action." Where in the FS is this information reported? As indicated in the general comments, add a section with this information if it is not included.

Commenting Organization: EPA

Commenter: White

Section: Appendix A Page #: 3-11

Lines #:

Specific Comment #: 98

Fish, first bullet – " . . . indicating that sediment PCB attenuation is occurring at a relatively slower rate than in fish and surface water." Delete "fish" given that attenuation rates in sediment have not been estimated and therefore cannot be compared to attenuation rates in fish.

Commenting Organization: EPA

Commenter: White

Section: Appendix A Page #: 3-11

Lines #:

**Specific Comment #: 99**

Fish, second bullet – add Table 8-4 from the Area 1 supplemental RI report to this section (Updated Cancer Risk Estimates and Hazard Quotients for Fish Consumption Pathway – 2009 95 percent UCL Fish Tissue Concentrations Smallmouth Bass and Carp). More detailed information about risk from fish consumption is needed in the FS to support remedial decision making.

**Commenting Organization:** EPA  
**Section:** Appendix A      **Page #:** 3-12  
**Specific Comment #:** 100

**Commenter:** White  
**Lines #:**

Source Control, first bullet, 12<sup>th</sup> line – “Continued monitoring of PCB levels in fish is needed to evaluate long-term recovery of PCB levels.” Change “recovery of” to “reduction in.” In the last sentence of this bullet, add the phrase “and other areas with potential unidentified hot spots.”

**Commenting Organization:** EPA  
**Section:** Appendix A      **Page #:** 3-13  
**Specific Comment #:** 101

**Commenter:** White  
**Lines #:**

First full paragraph, 4<sup>th</sup> line – “... this potential was evaluated to address whether bank stabilization to control PCB loading from river banks in areas outside of the former impoundments should be considered in the Area 1 FS.” Add the phrase “and to evaluate natural recovery potential” to the end of the sentence.

**Commenting Organization:** EPA  
**Section:** Appendix A      **Page #:** 3-14  
**Specific Comment #:** 102

**Commenter:** White  
**Lines #:**

First full paragraph, last sentence – “... and would have to be almost completely eroded to equal just the annual PCB load from the former Plainwell banks.” The purpose of the evaluation is not to determine the difference in the mass of PCBs remaining in the banks to the mass that was removed in the TCRAs, but rather to better understand the potential future PCB load to the channel sediments (and ultimately to fish tissue).

**Commenting Organization:** EPA  
**Section:** Appendix A      **Page #:** 3-14  
**Specific Comment #:** 103

**Commenter:** White  
**Lines #:**

Annual bank erosion was estimated as one-tenth to one-one-hundredth of the bank inventory. Also report the estimates as bank erosion rates in feet per year and assess whether these rates are consistent with erosion rates estimated for the former Plainwell impoundment and similar river systems.

**Commenting Organization:** EPA  
**Section:** Appendix A      **Page #:** 3-14  
**Specific Comment #:** 104

**Commenter:** White  
**Lines #:**

Last paragraph, 10<sup>th</sup> line – clarify what is meant by “the fine depositional sediment areas in the eroded portions of the Area 1 river channel.”

Commenting Organization: EPA

Commenter: White

Section: Appendix A Page #: 3-15

Lines #:

Specific Comment #: 105

“This uncertainty does not reflect a data gap that limits choice of appropriate remedies, but is similar to the uncertainty regarding continued low level inputs from the adjacent watershed, the atmosphere, and upstream areas.” Delete this sentence - a better understanding of the degree to which PCB concentrations in fish tissue are likely to be reduced and over what time frame does in fact influence the choice of an appropriate remedy.

Commenting Organization: EPA

Commenter: White

Section: Appendix A Page #: 5-2

Lines #:

Specific Comment #: 106

Section 5.1.1 – add Table 8-7 from the Area 1 SRI report (Risk-Based Concentrations for Fish and Sediments Derived by CDM [2003b] Based on the Angler Scenarios Evaluated in the CDM HHRA), and text to summarize how the RBCs were derived.

Commenting Organization: EPA

Commenter: White

Section: Appendix A Page #: 5-2

Lines #:

Specific Comment #: 107

Section 5.1.1, second paragraph – “Consequently, although 0.33 mg/kg is a default detection limit, it also serves as an appropriate PRG believed to be protective of both human health and wildlife.” Add more detail about the level of human health protection that is expected to be achieved, and justification for why a lower PRG (that is, a PRG that would achieve a higher level of human health protection) was not selected.

Commenting Organization: EPA

Commenter: White

Section: Appendix A Page #: 5-5

Lines #:

Specific Comment #: 108

In Table 5-1, add the pre- and post-remedy SWAC for the entire river section (river sections 2, 3, and 4) – the table appears to present the pre- and post-remedy SWAC for the hot spots only.

Commenting Organization: EPA

Commenter: White

Section: Appendix A Page #: 5-6

Lines #:

Specific Comment #: 109

8<sup>th</sup> line – “. . . and the SWAC upstream of the former Plainwell Impoundment (again excluding Portage Creek) would decrease from the current estimate of 0.53 to a predicted value of 0.48 mg/kg . . .” Replace this phrase with a summary of pre- and post-remedy SWACs for river sections 2, 3, and 4.

Commenting Organization: EPA  
Section: Appendix A Page # 5-10  
Specific Comment #: 110

Commenter: White  
Lines #:

First full paragraph – to complete the discussion, summarize the pre- and post-remedy SWACs for river sections 6-8 and Portage Creek.

Commenting Organization: EPA  
Section: Appendix A Page # 5-10  
Specific Comment #: 111

Commenter: White  
Lines #:

Section 5.1.4 –for each additional RAL, describe the spatial distribution of the deposits above various RALs. Are the deposits contiguous, concentrated in a particular section of Area 1, or scattered throughout Area 1?

Commenting Organization: EPA  
Section: Appendix A Page # 5-12  
Specific Comment #:112

Commenter: White  
Lines #:

50 mg/kg RAL – the text and Figure 5-13 indicate that the post-removal SWAC for the 50 ppm RAL is higher than the pre-removal SWAC.

Commenting Organization: EPA  
Section: Appendix B Page #:  
Specific Comment #: 113

Commenter: Saric  
Lines #: 16

This appendix does not include any work conducted at the Plainwell Mill near the Kalamazoo River. The work must be documented in Appendix B.

Commenting Organization: EPA  
Section: Appendix E Page #: Section 1.1  
Specific Comment #: 114

Commenter: White  
Lines #:

Section 1.1 - a first order trend model is used to determine historic rates of decline of fish tissue PCB concentration from 1993 to 2011. Analysis of first order decay processes in sediment and porewater is used to justify the use of a first order decay model for fish. Bioaccumulation processes should also be described and considered.

Commenting Organization: EPA  
Section: Appendix E Page #: 1-2  
Specific Comment #: 115

Commenter: White  
Lines #:

“This can be illustrated considering only the effect of burial of clean sediment on the surface sediment PCB concentration reduces to (Equation 1):” Change “burial of” to “burial by” and delete the phrase “reduces to.” Why isn’t Equation 1 used to estimate the recovery rate for sediments rather than assuming that the sediment recovery is the same as the predicted fish tissue recovery rates? Sediment transport and deposition processes control sediment recovery.

Commenting Organization: EPA  
Section: Appendix E Page #: 1-3, 1-4  
Specific Comment #: 116

Commenter: White  
Lines #:

The first paragraph on page 1-3 and second paragraph on page 1-4 only identify upstream and watershed sources as limiting the concentrations of PCBs in channel sediments. Revise the text to indicate that unremediated Area 1 sediments and floodplain soils also will be ongoing sources of PCBs to channel sediments that may limit the degree to which fish tissue PCB concentrations are reduced.

Commenting Organization: EPA  
Section: Appendix E Page #: 1-4  
Specific Comment #: 117

Commenter: White  
Lines #:

The estimated future fish tissue concentrations are converted to risk and hazard estimates. The presentation of the results would be simpler and easier to understand if the fish tissue concentrations were plotted and compared to RBCs and fishing advisory levels instead.

Commenting Organization: EPA  
Section: Appendix E Page #: 1-4  
Specific Comment #: 118

Commenter: White  
Lines #:

The last paragraph states that the natural recovery rates may be faster than historical rates because of the completed source control actions. However, it is more likely that the recovery rates will decrease as sediment and fish tissue concentrations approach equilibrium.

Commenting Organization: EPA  
Section: Appendix E Page #: 1-5  
Specific Comment #: 119

Commenter: White  
Lines #:

The fish tissue data for ABSAs 4.6 and 5 should be included and analyzed to evaluate whether and how the TCRAs influenced fish tissue concentration trends – was a step change observed?

Commenting Organization: EPA  
Section: Appendix E Page #: 1-5  
Specific Comment #: 120

Commenter: White  
Lines #:

Please explain why the fish tissue reduction rates are estimated using wet weight data rather than lipid-normalized data. Add an analysis of the historical trends based on lipid-normalized data.

Commenting Organization: EPA  
Section: Appendix E Page #: 1-6  
Specific Comment #: 121

Commenter: White  
Lines #:

“The 2011 mean wet-weight fillet PCB concentrations were the starting point for projection of future concentrations . . .”. The starting concentrations should be based on predicted concentrations from the historical trend model.

Commenting Organization: EPA  
Section: Appendix E Page #: 1-5 and 1-6  
Specific Comment #: 122

Commenter: White  
Lines #:

The analysis assumes that fish tissue concentrations will respond quickly (within 1 year) to changes in the sediment SWAC and that a step change in fish tissue concentration will occur when the active remediation phase is completed. Do the fish tissue data for ABSA 5 support this assumption?

Commenting Organization: EPA  
Section: Appendix E Page #: Table E-1  
Specific Comment #: 123

Commenter: White  
Lines #:

In Table E-1, the area and SWAC for river section 7 are shown as 28 acres and 0.90 mg/kg, respectively. The Area 1 supplemental RI reports the area as 39 acres and the SWAC as 0.96 mg/kg. Additionally, the area of river section 5 is reported as 110 acres in the Area 1 supplemental RI report and 105 acres in the FS report. Please reconcile the discrepancies.

Commenting Organization: EPA  
Section: Appendix E Page #: 1-8 and associated tables  
Specific Comment #: 124

Commenter: White  
Lines #:

Revise Tables E-4 and E-5 or add new tables with columns that represent risk reduction targets (for example, high-end sport angler, ELCR  $10^{-5}$ ; high-end sport angler, HI <1, advisory level one meal per week), the rows represent each river section, and the cells list the number of years to achieve the targets for a given river section.

Commenting Organization: EPA  
Section: Appendix E Page #: Section 1.1.5  
Specific Comment #: 125

Commenter: White  
Lines #:

The discussion of uncertainty – revise this section to indicate that “other sources” include ongoing PCB loading from the banks and floodplains to the channel and the limited understanding of how these processes will limit reductions in channel sediment and fish tissue PCB concentrations. Last sentence on page 1-13 – change to “future recovery rates may change” – they are more likely to decrease as the system approaches equilibrium than to be expedited. Note that key uncertainties will be addressed through collection of long-term monitoring data to verify the assumptions used in the recovery models.